COST REDUCTION BY OPTIMALIZATION MODELS OF OPERATION RESEARCH FOR PRODUCTION EQUIPMENT

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Abstract

Securing of fluent running of production process depends on the level of fixed capital that means machinery and equipment's that are used in the firm. Permanent care for fixed capital of the firm and economical operating with fixed capital brings high service cost and therefore it is necessary to follow up state of the machinery and production equipment's, their physical respectively moral depreciation. The main goal of this paper is to find out way for fixed capital renovation and to optimization interval of their real durability. Process of fixed capital renovation can be followed up from the view of management through quantitative methods of operation research named optimization model of fixed capital renovation. We obtained very important information for renovation - the optimal time after 5 years of using.

Keywords: optimization, fixed capital, reproduction, costs, maintenance.

Introduction

Operations research was originally concerned with improving the operations of existing systems. The first appearance of operations research as an academic discipline came in 1948 when a course in non-military techniques was introduced at the Massachusetts Institute of Technology in Cambridge. In 1952 a curriculum leading to a master's and doctoral degree was established at the Case Institute of Technology in Cleveland. Since then many major academic institutions have introduced programs. The first chair in operations research was created at the newly formed University of Lancaster in 1964. Similar developments have taken place in most countries in which a national operations research society exists. Prosperity of the firms depends in present time mainly from the timely and proper decision of management about way for obtaining of financial, raw material, material, technical and human sources, decision about work efficiency achieving for individual working places and employees in the production, about efficiency of firm's fixed capital using, about optimal management of stocking and sales, about localization of clients and transport, about environment of the firm, etc. Operations research methods are used in all areas – education, health service, space research, transportation, military, urbanism and government management. Operations research methods are using in conjunction with logistic technologies. It is a way of optimization and simulation methods application. These methods are suitable tools for logistics technology application. The importance of quantitative methods means: to increase the efficiency, to improve production capacity, to avoid time and profit

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Suggested citation: TEPLICKA, K. (2017) Cost reduction by optimalization models of operation research for production equipment. Comenius Management Review, 11 (1). p. 5-10.

losses (Fesenko, 2015). These operation research methods are used in various areas of economy. Utilization of optimizing methods authors present by the solving problem how to increase unemployment in the Czech Republic with the aim of optimizing (Krelinova, Krajcova, Vanduchova, 2012). The integration of urban infrastructures with information and communication technologies enables the development of new operations models. Utilization of operational models for digital economy in smart cities is today potential instrument for improvement (Li, F., Nucciarelli, A., Roden, S., Graham, G., 2016). Present management cannot run without significant using of quantitative methods during solving of economic problems of the firm. Exact accesses during decision and development of computer techniques have become decisive impulse and basis for development of quantitative accesses in management and therefore this article will be orientated mainly to the using of models for renovation during solving of optimizations of the renovation time for machinery and equipment. In production firm it is necessary to use production equipment that is main production tool and its service situation is necessary assumption for securing of fluent production. Due to this reason it is necessary to search time interval for renovation of production equipment. During duration of its using there is rising high cost for its service, securing of repair and maintenance, and firm must inevitably minimize such cost. Very important optimization method is Monte Carlo method for decision making and it represents an excellent approach to economic risk management. (Janekova, Fabiánová, Rosová, 2016). Strategic tool of optimize is too outsourcing. Outsourcing has become a common tool in many companies over the world. The application of the outsourcing principles is one of the ways of the overhead costs' reduction. Cost reduction is aim of optimize in the firm. (Potkány M., Stasiak-Betlejewska R., Kováč R., Gejdoš M.,2016). New optimize methods are very important instruments for competitiveness, effectiveness and productivity. They are key factors for evaluation performance of the firm.

Methodology of model of renovation

During problem solving that is priority for the firm in area of production equipment renovation we have solved this problem according models using from operation analysis renovation. Basis of this model is to follow up process of production equipment wearing in sense of removing of negative consequences due to the physical wearing and to follow up volume of service cost, that are connected with securing of production equipment repair and maintenance. When managing subject should to decide about time of production equipment displacing form the production process due to its obsolescence, malfunction or high service intensity, it must apply following decisions (Teplická, 2008):

- To evaluate physical state of production equipment,
- To evaluate durability of equipment in relation to the technical durability,
- To evaluate level of depreciation of production equipment,
- To evaluate financial possibilities for new investment,
- To evaluate way for new production equipment obtaining.

Model of renovation is effective way for finding of optimal value that means stating of service year in which production equipment will be properly renewed

Table 1. Algorithm for solving of renovation

Algorithm of solving	Index
Stating of service costs in (€)	$Np(t)$
Stating of remain price in (€)	$Z_c(t)=O_c-\sum O_t$
Calculation of discount factor	$v=\frac{1}{1+i}$
Calculation of discount factor for period (t)	$v=(\frac{1}{1+i})^t$
Calculation of discount factor for period (t-1)	$v=(\frac{1}{1+i})^{t-1}$
Calculation of discounted service cost	$Np(t)=Np_t * v^{t-1}$
Calculation of cumulative discounted service cost	$Np(t)=\sum_{t=1}^{n} Np_t * v^{t-1}$
Calculation of discounted remain price	$Zc(t)=Zc_t * v^t$
Calculation of purpose function	$1-v^t$
Calculation of function f(t) for total cost of fixed capital using - Nc(t)	$f(t)=\frac{Oc+\left(\sum_{t=1}^{n} v^{t-1} * Np_t\right)-\left(v^t * Zc_t\right)}{1-v^t}$

Source: Teplicka (2008)

Legend: t- years of machinery using, ZCt – remaining price – cost of acquisition cutting about the level of depreciation(for depreciation calculation there are used various accounting methods for depreciation, firm has chosen depreciation according machinery performance), NPt- Service cost for maintenance and machinery repair that means assumed cost stated by statistics, v- interest rate, discounting factor, i- interest tariff on the capital market, Oc- acquisition price of production equipment.

Analysis of problem

In service of production firm there is production equipment, that has acquisition price – 300 000 € and recommended time for depreciation is given by technical assumption – 7 years, that means technical durability of production equipment. From the data of operative evidence we have find out, that service cost in every year of its using are increasing about 10 000 €, in 6th year of using cost will increase about 20 000 € (planned maintenance) and in 7th year of using about 30 000 € (planned general repair). Remaining price is stated according depreciation plan for production equipment.

Table 2. Basic parameters of cost for production equipment using

year(t)	1	2	3	4	5	6	7
Zc_t v (€)	200 000	133 300	100 000	75 000	50 000	30 000	30 000
NP_t v (€)	60 000	70 000	80 000	90 000	10 0000	120 000	150 000

Source: author

During using of model for optimal renovation of production equipment with regarding to the time, that means by discounting of financial means consumed for machinery service process will be according algorithm (Table 1). We will state optimal time for production equipment renewal (t opt) according stating of minimal value of criteria function (ft) in (€) – minimal cost. For calculation we will need to know interest rate that is in our case 10(%).

Table 3. Calculation of optimal time for renovation with time regarding

Year (t)	1	2	3	4	5	6	7
NP_t (€)	60 000	70 000	80 000	90 000	100 000	120 000	150 000
ZCt (€)	200 000	133 300	100 000	75 000	50 000	30 000	30 000
v^t	0,9090	0,8264	0,7513	0,683	0,6209	0,56447	0,51315
v^{t-1} x NP_t(€)	60000	63636	66115	67618	68301	74510	84671
$\sum v^{t-1}$x NP_t(€)	60000	123636	189751	257369	325670	400180	484851
v^t x ZC_t	181818	110164	75131	51226	31046	16934	15395
f_t (€)	1 959 982	1 806 130	1 667 216	1 596 716	1 568 597	1 568 760	1 580 478
f_t - min					**1 568 597**		

Source: author

Results and discussion

From the calculation it results, that optimal time for renewal of production equipment should be after 5 years of its service, since value of cost function is minimal in this year and after 5th year service cost starts to increase. Goal of the management is to decrease service cost for production equipment and therefore management must decide how to renew production equipment.

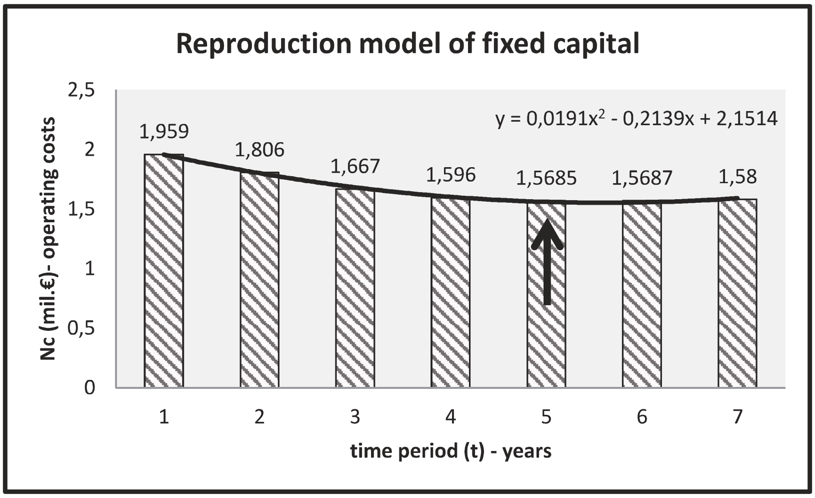

Figure 1. Reproduction model of fixed capital (Source: author)

Such Access of model solving for optimization is showing to the time interval of renewal, but it does not follow up way of production equipment renovation, and it is its disadvantage. For given firm it is necessary to make renovation after 5th year of production equipment service. When firm has enough financial means for extended reproduction and when firm decide to invest money for buying of new equipment, it will be one of the possibilities how to decrease cost for old equipment service, but there will be other problem in sense of financial means return on investment to new equipment.

Acknowledgements

This paper is part of project VEGA 1/0741/16.

Conclusion

Renovation models enable management to decide about fixed capital renovation and to plan necessary financial means for securing of fixed capital renovation, that means machinery and production equipment that are necessary for securing of fluent production. Quantitative methods are today most important tool of management for every firm that must decide about risk conditions, indefinites or definite, it must also choose proper alternative for economic problem solving and to apply economical problem solving in practice. Modelling serves for such situations that mean illustration of reality through mathematical expressions and its economical interpretation. Machine and equipment renovation is an important aspect of plant management. Renovation is the process of improving a broken, damaged, or outdated structure. Preventive maintenance is very important part of equipment and machine attendance in the firm. Total productive maintenance (TPM) is a maintenance philosophy that requires the total participation of the workforce. TPM incorporates the skills of all employees and focuses on improving the overall effectiveness of the facility by eliminating the waste of time and resources. Typically, total productive maintenance is a concept that is most easily applied to a manufacturing facility. TPM emphasizes all aspects of production, as it seeks to incorporate maintenance into the everyday performance of a facility. To do this the maintenance performance is one factor that is considered when evaluating the performance of the facility. Most important measurements of total productive maintenance are quantitative methods of operation research for equipment effectiveness.

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UNDERSTANDING THE CULTURAL ASPECTS IN A MULTINATIONAL COMPANY TO ENSURE QUALITY

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Abstract

In the current global marketplace, it is not possible to stand without multinationalism. The companies with multinational workforce have benefits when challenging with other companies because of their multiface backgrounds depending on the culture of employees. Multicultural background helps the companies to think without borders, which is realized with the help of peoples' unique cultural experiences. The companies that can create a sense of cultural awareness can learn to think and decide from different angles when they face a problem. To gain the cultural awareness, the companies have to understand and respect different aspects of cultures starting from the employees' level. If a company can build the harmonie between its workers, it will be a great step for increasing its market share in the production-consumption arena within the quality standards. This paper defines the art of understanding the cultural aspects in a multinational company that will help to understand the employees and their cultures to have a higher quality in working circumstances.

Keywords: multinational, quality, culture.

Introduction

Understanding the cultural aspects helps to improve the success of the projects, enhance the quality and reduce the risk factors in the multicultural companies. On the other hand, it helps teams to be more productive and more motivated only if the cultures of the team members are taken into account. It is an art to let the team members from different cultures to work in harmony. In order to realize this, a specific quality methodology depending on the company's culture has to be adopted among and within different cultures in the team to let the team members understand each other and manage cross-cultural changes. So it is a good starting point to study the dimensions of the national cultures, try to find out their negative and positive influences to the project and provide a framework to understand the cultural aspects in a multinational company. As a result, the organizations which are good in understanding the cultural aspects gain market share, increase profits, lower costs and improve quality. They deliver much faster in comparison to other organizations and win loyal customers. But the most important thing which mustn't been forgotten is that, a multinational company can live where there is a cultural participation which means the culture of the employees in the organization. To stay at the top of the market, the most important approach is to understand the culture of the employees and letting everyone play a role in the process

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Suggested citation: ÖZDEMIROĞLU, M. O. and FEKETE, M. (2017) Understanding the cultural aspect in a multinational company to assure quality. *Comenius Management Review*, 11(1), p. 11-30.

changing phase. The growing need to work between cultures requires intercultural cooperation as an obligation.

1 Background

"Quality" means those features of products which meet customer needs and thereby provide customer satisfaction. In this sense, the meaning of quality is oriented to income. The purpose of such higher quality is to provide greater customer satisfaction and, one hopes, to increase income. However, providing more and/or better quality features usually requires an investment and hence usually involves increases in costs. Higher quality in this sense usually "costs more" (Juran and Godfrey, 1999). "Quality" means freedom from deficiencies—freedom from errors that require doing work over again (rework) or that result in field failures, customer dissatisfaction, customer claims, and soon. In this sense, the meaning of quality is oriented to costs, and higher quality usually "costs less" (Juran and Godfrey, 1999).

Quality management (QM) can be described as a method for ensuring that all the activities necessary to design, develop and implement a product or service are effective and efficient with respect to the system and its performance. To implement the quality mentality and to plan the quality is an art for the managers to improve their organizations. In order to have a common quality understanding on all over the world, some different skills have to be developed according to the nation's ethics, culture, organization structure, working skills, relationship of the workers with each other or with the leader, education level of the employees. Too even human factor is not given the attention it deserves. This is the element which determines the internal motivation, commitment levels, and if an organization is to gain the full benefits of QM, it needs to have the whole-hearted participation and support of every individual (Peat, 1993).

2 Methodology

Qualitative research/interview is based on words, feelings, emotions, sounds and other non-numerical and unquantifiable elements (Dudovskiy, 2016). It has to be noted that, "information is considered qualitative in nature if it cannot be analyzed by means of mathematical techniques. This characteristic may also mean that an incident does not take place often enough to allow reliable data to be collected" (Herbst and Coldwell, 2004).

The strength of qualitative research/interview is its ability to provide complex textual descriptions of how people experience a given research issue. It provides information about the "human" side of an issue – that is, the often contradictory behaviors, beliefs, opinions, emotions, and relationships of individuals (Mack et al., 2011). Qualitative methods are also effective in identifying intangible factors, such as social norms, socioeconomic status, gender roles, ethnicity, and religion, whose role in the research issue may not be readily apparent. When used along with quantitative methods, qualitative research/interview can help us to interpret and better understand the complex reality of a given situation and the implications of quantitative data (Mack et al., 2011).

Qualitative research/interview will help to explore attitudes, behavior and experiences through such methods as interviews or focus groups to get an in-depth opinion from participants. As qualitative research/interview continues, behaviors and experiences which are important, fewer people take part in the research, but the contact with these people tends to last a lot longer. Qualitative research/interview can be detailed with many different methodologies but the most important ones can be:

- **Participant observation** is a qualitative method with roots in traditional ethnographic research, whose objective is to help researchers learn the perspectives held by study populations (Mack et al., 2011). As qualitative researchers presume that there will be multiple perspectives within any given community. They analyze both in knowing what those diverse perspectives are and in understanding the interplay among them.
- **In-depth interviews** is a technique designed to elicit a vivid picture of the participant's perspective on the research topic (Mack et al., 2011). During in-depth interviews, the person being interviewed is considered the expert and the interviewer is considered the trainee. The researcher's interviewing techniques are motivated by the motivation to learn everything the participant can share about the research topic. Researchers engage with participants by arranging questions in a neutral manner, listening attentively to participants' responses, and asking follow-up questions and probes based on those responses. Researchers do not lead participants according to any preconceived notions, nor do they encourage participants to provide particular answers by expressing approval or disapproval of what they say.
- **Focus groups** are effective in eliciting data on the cultural norms of a group and in generating broad overviews of issues of concern to the cultural groups or subgroups represented (Mack et al., 2011). In these method one or two researchers and several participants meet as a group to discuss a given research topic. These sessions are usually recorded. The moderator/researcher leads the discussion by asking participants to respond to open-ended questions – that is, questions that require a detailed response rather than a single phrase or simple "yes" or "no" answer. If there is a second researcher, he takes detailed notes on the discussion. A principal advantage of focus groups is that they harvest a large amount of information over a relatively short period of time. They are also effective for accessing a large range of views on a specific topic, as opposed to achieving group consensus. As it is hard to acquire information on highly personal or socially sensitive topics by focus groups method; one-on-one interviews can be used.

For understanding the cultural aspects, qualitative research/interview shall be used as an approach for exploring and understanding the meaning of individuals or groups ascribe to a problem. The process of interviewing will involve emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the interpretations of the meaning of the data. The final written report will have a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation.

The reasons why the companies shall use qualitative research/interview techniques are as follow:

- Managers mustn't limit themselves and the employees in the companies with predefined questions and answers. Because of flexibility that mentioned under the topic "Qualitative Research/Interview", this method fits to our requirements.
- Managers need to explore the problem in dept. In this case quantitative methods are too shallow as we need to go for ethnographic methods, interviews, in-depth case studies and other qualitative techniques.
- Managers have to give suggestions to solve the problems. The hypotheses to be tested may be developed using exploratory "Qualitative Research".
- Managers have to be ready for the unexpected variables. The research field is based on the cultures which is very complex. In "Qualitative Method" new emerged unexpected variables can be taken into account.
- Managers have to make the correlation between the meanings of the events or circumstances. With the "Qualitative Methods" managers have a better chance to observe the events and circumstances that causes differences.

Qualitative methods are typically more flexible which means, they allow greater spontaneity and adaptation of the interaction between the managers and the employee. As an example, qualitative methods ask mostly "open-ended" questions that are not necessarily worded in exactly the same way with each participant. With open-ended questions, employees are free to respond in their own words, and these responses tend to be more complex than simply "yes" or "no" (Mack et al., 2011).

Also within the qualitative methods, the relationship between the manager and the employee is generally less formal than in quantitative research. Employees have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods where the managers have the opportunity to respond immediately to what employees say by tailoring subsequent questions to information the employee has provided (Mack et al., 2011).

3 Cultural Awareness to Quality

In the past two decades many organizations throughout the world have been under tremendous pressure. Some have been battered by international competition, others by new entrepreneurial companies that redefined businesses, and yet others were seriously challenged by new technologies which created formidable alternatives to their products and services. Some leading companies have changed rapidly. While some of the new companies have now become major players, other companies are still engaged in daily battles for survival, and many other companies have disappeared. Many companies have found that all of their radical restructuring, reengineering, downsizing, and numerous quality programs may have helped them survive, but they still do not have a distinctive quality advantage. Their future will be determined by three key areas: alignment, linkage, and replication.

Combined with the fundamental concepts of QM (continuous improvement, customer focus, and the value of every member of the organization), their work in these three key areas is transforming the way they are managing the entire organization. During these years there has been an increasing global emphasis on QM. In global competitive markets, quality has become the most important single factor for success (Juran and Godfrey, 1999). QM has become the competitive issue for many organizations. The goal of high quality which must compete with other national goals amid the massive forces - political, economic, and social - which determine the national priorities is common to all countries.

The growth of international trade and of multicultural companies has required the attention be directed to understanding the impact of national culture on managing for quality. To aid in this understanding, the subject can be organized under the following general titles:

- Language: Many multicultural harbor multiple languages and numerous dialects. These are a serious barrier to communication.
- Customs and traditions: These and related elements of the culture provide the precedents and premises which are guides to decisions and actions.
- Ownership of the companies: The pattern of ownership determines the strategy of short-term versus long-term results, as well as the motivations of owners versus non-owners.
- The methods used for managing operations: These are determined by numerous factors such as reliance on system versus people; extent of professional training for managers; extent of separation of planning from execution; careers within a single company versus mobile careers.
- Suspicions: In some countries, there is a prior history of hostilities resulting from ancient wars, religious differences, membership in different clans, and so on. The resulting mutual suspicions are then passed down from generation to generation.

It is clearly important to learn about the nature of a culture before negotiating with members of that culture. Increasingly, companies have provided special training to employees before sending them abroad. Similarly, when companies establish foreign subsidiaries, they usually train local nationals to qualify for the senior posts (Juran and Godfrey, 1999). Multinational collaboration across cultures is also a problem with many faces. For example, a system can be designed in country A, but the subsystem designs can come from other countries. In this manner, companies from multiple countries may supply components, carry out manufacture, marketing, installation, maintenance, etc. Consequently, the solutions to the problems also differ. As it can be understood from this picture, it is a necessity to observe and to interpret the different QM mentalities of different cultures to have a common quality standard.

4 Cultural Aspects in a Multinational Company

The purpose of this work is to study the project quality management applications in multicultural companies to find out possible bottlenecks and also to create new suggestions on how to solve them. Before defining the case study, the frame of the study with theoretical background must be introduced.

4.1 Cultural dimensions theory

Cultural dimensions theory is a framework for cross-cultural communication, developed by Geert Hofstede. It describes the effects of a society's culture on the values of its members, and how these values relate to behavior, using a structure derived from factor analysis. The theory has been widely used in several fields as a paradigm for research, particularly in cross-cultural psychology, international management, and cross-cultural communication (Hofstede, 2001). In 1980, the Dutch management researcher Geert Hofstede first published the results of his study of more than 100,000 employees of the multinational IBM in 40 countries (Hofstede, 1980, 1983, 1984, 1991, 1997, 2001). Hofstede was attempting to locate value dimensions across which cultures vary. His dimensions have been used frequently to describe cultures.

Hofstede identified four dimensions that he labeled:

- Individualism-collectivism,
- Masculinity-femininity,
- Power distance and
- Uncertainty avoidance.

His individualism-collectivism dimension describes cultures from loosely structured to tightly integrated. The masculinity-femininity dimension describes how a culture's dominant values are assertive or nurturing. Power distance refers to the distribution of influence within a culture. And uncertainty avoidance reflects a culture's tolerance of ambiguity and acceptance of risk.

Hofstede and Bond (1984; also see Chinese Culture Connection, 1987) identified a fifth dimension, a Confucian work dynamism, also labeled “long-term orientation versus short-term orientation to life”. The Confucian work dynamism dimension describes cultures that range from short-term values with respect for tradition and reciprocity in social relations to long-term values with persistence and ordering relationships by status.

In the 2010 edition of cultures and organizations: Software of the Mind, Hofstede and his co-authors added a sixth dimension: “Indulgence versus self-restraint” (Jandt, 2015). “Indulgence is a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. Restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms” (Hofstede et al., 2010).

In the Table 1, the Hofstede dimension rankings which are changed in 2001 can be seen for the first 50 countries and three regions on the topics, individualism (IvC), masculinity (M/F), power distance (Pdi) and uncertainty avoidance (UAI). In the last column of the same table, the long-term orientation (LTOvSTO) rankings for the first 23 countries can also be seen. In the Table 2, the Hofstede dimension rankings for indulgence and restraint (IVR) are to be seen.

Table 1. The Hofstede Dimension Rankings for IvC, M/F, Pdi, UAI, and LTOvSTO

Countries	**IvC**	**M/F**	**PDi**	**UAI**	**LTOvSTO**
Arab countries	26/27	23	7	27	
Argentina	22/23	20/21	35/36	10/15	
Australia	2	16	41	37	15
Austria	18	2	53	24/25	
Bangladesh		-	-	-	11
Belgium	8	22	20	5/6	
Brazil	26/27	27	14	21/22	6
Canada	4/5	24	39	41/42	20
Chile	38	46	24/25	10/15	
China	-	-	-	-	1
Colombia	49	11/12	17	20	
Costa Rica	46	48/49	42/44	10/15	
Denmark	9	50	51	51	
East Africa	33/35	39	21/23	36	
Ecuador	52	13/14	8/9	28	
El Salvador	42	40	18/19	5/6	
Finland	17	47	46	31/32	
France	10/11	35/36	15/16	10/15	
Germany	15	9/10	42/44	29	14
Great Britain	3	9/10	42/44	47/48	18
Greece	30	18/19	27/28	1	
Guatemala	53	43	2/3	3	
Hong Kong	37	18/19	15/16	49/50	2
India	21	20/21	10/11	45	7
Indonesia	47/48	30/31	8/9	41/42	
Iran	24	35/36	29/30	31/32	
Ireland	12	7/8	49	47/48	
Israel	19	29	52	19	
Italy	7	4/5	34	23	
Jamaica	25	7/8	37	52	
Japan	22/23	1	33	7	4
Malaysia	36	25/26	1	46	
Mexico	32	6	5/6	18	
New Zealand	6	17	50	39/40	16
Nigeria	-	-	-	-	22
Norway	13	52	47/48	38	
Pakistan	47/48	25/26	32	24/25	23
Panama	51	34	2/3	10/15	
Peru	45	37/38	21/23	9	
Philippines	31	11/12	4	44	21
Poland	-	-	-	-	13
Portugal	33/35	45	24/25	2	
Singapore	39/41	28	13	53	9
South Africa	16	13/14	35/36	39/40	

Countries	IvC	M/F	PDi	UAI	LTOvSTO
South Korea	43	41	27/28	16/17	5
Spain	20	37/38	31	10/15	
Sweden	10/11	53	47/48	49/50	12
Switzerland	14	4/5	45	33	
Taiwan	44	32/33	29/30	26	3
Thailand	39/41	44	21/23	30	8
The Netherlands	4/5	51	40	35	10
Turkey	28	32/33	18/19	16/17	
United States	1	15	38	43	17
Uruguay	29	42	26	4	
Venezuela	50	3	5/6	21/22	
West Africa	39/41	30/31	10/11	34	
Yugoslavia	33/35	48/49	12	8	
Zimbabwe	-	-	-	-	19

Source: Hofstede (2001)

Table 2. The Hofstede Dimension Rankings for IVR

Indulgence Versus Restraint	
High-Indulgence Countries	**High-Restraint Countries**
1. Venezuela	74. Morocco
2. Mexico	75. China
3. Puerto Rico	76. Azerbaijan
4. El Salvador	77-80. Russia
5. Nigeria	77-80. Montenegro
6. Colombia	77-80. Romania
7. Trinidad	77-80. Bangladesh
8. Sweden	81. Moldova
9. New Zealand	82. Burkina Faso
10. Ghana	83-84. Hong Kong
11. Australia	83-84. Iraq
12-13. Cyprus	85-87. Estonia
12-13. Denmark	85-87. Bulgaria
14. Great Britain	85-87. Lithuania
15-17. Canada	88-89. Belarus
15-17. Netherlands	88-89. Albania
15-17. United States	90. Ukraine
18. Iceland	91. Latvia
19-20. Switzerland	92. Egypt
19-20. Malta	93. Pakistan

Source: Hofstede et al., 2010

4.2 Multicultural factors on business processes

"Business process" to refer to office work being seen as a process (Hammer, 1990), (Davenport and Short, (1990). This defines the people doing office work and the steps in the process are tasks that people do.

This is to distinguish it from other kinds of processes, such as chemical processes and manufacturing processes, which might also be critical to a business (Swenson and Farris, (2009). If there is a human factor, the cultural differences of the people in the organization must be good understood so that the improvement or the redesign of the processes can be done as targeted. As an example, decision of specific organizational structure (e.g. flat hierarchy) which must be used in the organization while designing the processes, can be obtained from the cultures of the employees'.

4.3 Defining business processes in multicultural companies

BPM and BPR are disciplines rather than technologies or tools. BPM and BPR are not softwares, which can be used to correct an issue in the business. Human factor plays an important role in the business process management and reengineering. Despite the fact that, BPM and BPR are initially focused on the automation of business processes with the use of information technology, the main aim is to integrate human-driven processes with the use of technology, in which human interaction takes place in series or parallel.

Defining business process is the key to transform the way people work in organization. Even very small changes in processes can have dramatic effects on cash flow, service delivery and customer satisfaction. Even the act of documenting business processes alone will typically improve organizational efficiency by 10% (Carter, 2005).

Due to the importance of the cultural diversity in the organizations, the companies have to pay maximum attention to the following points while defining the processes:

- **Acceptance of the defined improvement or design by the current culture in the organization**: First step before the process change is to make sure the current cultures in the company will be open to changes. The way to this aim is to involve the people in the process. The most efficient method of determining what processes need to be altered and revised is to involve the employees. They will take more ownership of the process being developed. On the other hand, people show more willing to understand and accept changes that they are instrumental in determining. This is, of course much more effective than having an assessment team coming with a new program and forcing it on the subordinates with no input. The pluralistic action including all the cultural colors in the decision helps the organization to find the real changes to implement.
- **Required skills of the employees for the changes**: Depending on culture, the employees can have different understanding of self-developing. Some do accept the lack of their skills, some do not. Depending on the culture, an investigation which can be like computer aptitude tests, short survey questionnaires, group discussions, etc. must be performed.
- **Levels of training for the defined improvement or design**: After detecting the required skills, training programs depending on the culture of employees must be developed for all levels of employees.

- **Control of the level of stress placed on the individuals impacted by the defined improvement or design**: The first thing to be considered is to make sure of having stress release valves in the organization. Even though change is necessary, it is often extremely stressful. If people don't feel comfortable to meet the challenges of the changes, the stress is even greater. Also, the culture factor is again very important. The impact of the changes differs also from culture to culture which must be observed attentively. Bringing balance in the process for the employees to release frustration and deal with issues openly may be the biggest factor in getting the change phase to succeed. Letting frustration and anxiety to build up over time will only result in greater resistance and potential failure which turns into catastrophe during the improvement or the design of the processes.

4.4 Multicultural Teams in Companies

The smallest multicultural group in a company is a team. If the behaviors of the multicultural teams are analyzed correctly, the project quality management strategies can be redesigned easily to have a problem-free management.

There is no common definition of the culture, but it can generally be defined as "shared ways of thinking, feeling, and reacting; shared meanings and identities; shared socially constructed environments; common ways in which technologies are used; and commonly experienced events…" (House, Wright and Aditya, 1997). Also, culture has been described as the "collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede, 1980). As it can be observed, the culture is a very important catalysator in business life when it has to function over people such as employees, suppliers, customers, stakeholders etc. Corporate culture is the entirety of shared values, standards, stances and attitudes that shape the decisions, actions and behaviour of the members of the organization (Unmuessig and Fekete, 2011). Therefore, cultural differences have impacts on projects and occurred problems on multicultural companies.

Although we grow up and live in a particular culture, it is also something that we acquire (or learn) over time as a result of social interactions. Just as the transmission of genetic data accounts for biological similarities among people, so the transmission of cultural data may be seen to be responsible for behavioral similarities (Martinsons and Davison, 2000). Cross-cultural research has had most value therefore when it has been able to provide substance to modern management practices and techniques (Jones, 2007).

If we make the definition of a team again, a team is a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and are seen by others as an intact social entity, embedded in one or more larger social systems and who manage their relationships across organizational boundaries (Cohen and Bailey, 1997). Types of teams in multicultural companies:

- **Formal teams** are the building blocks of organizations (Halverson and Tirmizi, 2008). The formal team has a high level of boundary spanning which may operate across departments within organizations. The formal team has a more rigid organizational structure, as team members tend to have distinct roles and the workload is distributed appropriately. Formal teams can be set up to address particular tasks that the organization seeks to accomplish within a specific time period. The team members have a high degree of interdependence and both the process and performance are integral to the success of the formal team. A product development team consisting of members from the engineering, marketing, and production departments of a plant would be considered a formal team.

- **Informal teams** meet to solve specific problems, and their membership may change with the task that the team seeks to accomplish (Halverson and Tirmizi, 2008). Informal teams thus have a high level of boundary spanning like formal teams. On the other hand, members of informal teams have a lower level of interdependence than formal teams, consistent with a less-rigid organizational structure. An informal group might be formed in a development organization, for example, to understand and offer some suggestions about problematic issues from customers. Members of the group might primarily be engineers.
- **Task forces** are teams organized for a specific project, and they are generally managed by the organization that initiated them (Halverson and Tirmizi, 2008). The task force team has a great deal of interdependence between members and a strong emphasis on performance and timetables.
- **A committee** is similar to a task force in that it is focused on a specific project for a discrete period of time (Halverson and Tirmizi, 2008). A committee can be a group of people who are formally delegated to perform a task like a search process or a decision-making process. Committees may also be formed to take action on a matter without the explicit involvement of the organization the committee members belong to. In other words, a committee may have different levels of member interdependence and varying degrees of autonomy from the members' organizations. Along the spectrum of team autonomy, committees may have more autonomy than task forces.
- **Self-managed teams** have the greatest degree of autonomy from the organization and have a strong emphasis on performance (Halverson and Tirmizi, 2008). These teams combine aspects of formal and informal teams, since they are inaugurated by the organization's management but take on the responsibility for their own management. In self-managed teams, most decision-making authority is turned over to a group that works interdependently in order to accomplish an assigned work.
- **Virtual teams** are formed and joined electronically with negligible face-to-face contact (Halverson and Tirmizi, 2008). Even though virtual teams are not necessarily as autonomous as self-managed teams, team members have a high degree of autonomy. In contrast to formal and self-managed teams, virtual teams are less interdependent because of the nature of virtual communications and the multiplicity of organizations that can be involved.

4.5 Team performances of multicultural teams

To analyze the team performances of multicultural teams, it is important to analyze the organizational context of the team, the nature of the team's diversity, and the relationship between these factors and the task of the team. The history and experience shared by members of an organization and individual behaviors formed by the national culture forms the organizational cultures. That means, many organizational cultures with a wide range of differences co-exist in a national culture. As team members belong to similar educational, occupational, and socioeconomic subgroups, they might be more homogeneous than the national cultures they are part of. On the other hand, team members might differ in age, religion, race, locality, or other subgroup affiliations within a national culture (Halverson and Tirmizi, 2008). Membership in diverse subgroups and social identity help explain why individuals from the same national culture bring different behavioral expectations to a team (Brannen, 1994). Put in differently, members of a team represent not only the national cultures that they come from but also many other subcultures and identities. That means, multicultural teams must be seen as having many facets that are not limited to diversity in national cultures.

The research from Brannen and Salk's in 2000 declares that the effects of multifaceted diversity and suggests that cultural differences do not necessarily have a negative impact on team performance. Differences do not cause team conflicts; contrariwise, the organizational context and individual team members' responses to cultural norms mediate differences. In order to bridge cultural boundaries, team members of an increasingly diverse workforce must actively cope with cultural differences. This kind of mechanism can be the formation of a hybrid culture within the multicultural team.

The topic in the same research by Brannen and Salk (2000) about power and influence, Brannen and Salk's work indicates that uncertainties experienced by teams determine which individual attributes will influence team behavior. As team members who have many potential identities, do not necessarily exemplify the values of their culture or organization, the organizational context is an important variable in determining which attributes will affect team performance. The research of Brannen and Salk (2000) emphasizes the multiplicity of cultural identities, and shows that organizational context plays a central role in deciding the relative importance of those identities (Halverson and Tirmizi, 2008).

The observational research on the output of multicultural teams provides divergent results. There are many studies which show that heterogeneous groups outperform homogenous groups. Conversely, some studies show that unpracticed communication and the subsequent conflict of more diverse teams which results "process loss" is avoided by homogenous teams. The research of Williams and O'Reilly in 1998 reviewed 40 years of diversity research and came to the conclusion that diversity does not have any predictable effects on team performance. Their analysis called for further research incorporating a more complex conceptualization of diversity and inclusion of context (e.g., organizational aspects, task type), types of diversity (informational and demographic), and process variables such as conflict and communication (Halverson and Tirmizi, 2008). A research which was done by Jehn et al. in 1999 attempts to integrate these concepts with a model which shows how various types of diversity affect performance. The model includes three types of diversity discussed in the research (informational diversity, social category diversity, value diversity). Informational diversity refers to the differences between team members' educational background, work experience, and specialties. Social category diversity, or visible diversity, originates to the differences that people perceive first, such as gender, race, and ethnicity. Value diversity introduces essentially differences in what team members perceive the team's task and purpose to be. The Jehn et al. research found that low value diversity and low social category diversity allow a multicultural team to take advantage of its informational diversity (Halverson and Tirmizi, 2008).

A study by Nonaka and Takeuchi in 1995 declare that informational diversity is not an advantage unless team members can capitalize on it. Another study by Tsui and O'Reilly (1989) also shows that even when teams possess advantageous aspects of diversity, performance will only improve to the degree that team members can overcome conflictual aspects of diversity. The research of Jehn et al. in 1999 also shows that some similarity in perspective among team members is necessary to facilitate successful group interaction.

Their research correlated specific types of diversity with advantageous outcomes. For instance, high information diversity and low value diversity creates a high performing team and maximizes effectiveness, while low value diversity alone leads to more efficient teamwork (Halverson and Tirmizi, 2008). Jehn et al. in 1999 also showed in her results that value diversity becomes more important for team performance over time while social category diversity becomes less significant over time. This conclusion is also supported by the researches of Owens and Neale (1999) and Salk (1996) on the relative prominence of national cultural differences in multicultural teams.

The Jehn et al. 1999 research shows that when task interdependence is high, social category diversity lead to higher team morale. Also in a research by Trefry and Vaillant in 2002, it is stated that, multicultural team members reported enhanced capability to deal with unexpected events and increased self-confidence. Team members also informed that they had re-examined their perspectives when confronted with different perspectives.

These individual benefits, including flexibility in response to unanticipated events, give multicultural teams a distinct competitive advantage which can be observed in the team's output, especially when members are able to mediate conflicts caused by value diversity (Halverson and Tirmizi, 2008).

In this manner, researches on multicultural teams bring on to three conclusions about team performance:

- Specific types of diversity affect team process and performance more than other differences.
- Team members' responses to diversity and conflict are the key points in determining how teams will be affected, in both process and performance.
- The type of task assigned to the team and the level of task interdependence are also important variables in the success of a multicultural team. That means, the nature of a team's diversity can be an advantage or a disadvantage depending on the task involved and how the teamwork is managed.

4.6 Conflict resolution in multicultural teams

Another very important point on the way to gain a company success is to have a conflict free working environment. Conflict can be described as an intense disagreement process between two interdependent parties over incompatible goals and the interference each perceives from the other in her or his effort to achieve those goals.

Conflict is inevitable. No matter where we work, sooner or later we're going to find ourselves in a disagreement with someone. We've all heard of disputes that erupt into expensive and divisive lawsuits. A simple personality conflict between two members of a team can cripple productivity and in the end, leave the entire team feeling angry and betrayed.

Conflicts between work employees can spring from any number of sources; miscommunication, unmet expectations, feelings that one's contributions have not been acknowledged. Conflicts and disputes seldom have a simple cause, but they arise when people choose to make their differences into disagreements. If conflict is the result of individual choices, managers that want to successfully manage and resolve conflicts must create an environment where employees can make the right choices. The optimum strategy depends on building the right group norms in the first place. If employees are open to differences effectively to reach good decisions, then employees will be able to express differences appropriately and effectively resolve them.

The wonderful thing about dispute and conflict resolution is that when managed effectively, not only does it help to address many conflicts that can pull you down, but it liberates all sorts of energy. Conflicts constructively addressed not only avoid something that would have been otherwise festering and difficult, but they also usually lead to insights and opportunities that might not be seen otherwise (Sommer, 2012).

It would be wrong to describe the traditional way of analysis and problem solving as circuitous. Rather, it is inclusive and multifaceted.

Conflict-management practices need to be viewed in the light of the societal values. Confrontational methods are uncommon among coworkers. It was observed that even business negotiations have to be subtle, with the parties establishing some personal relationship and pursuing economic interests in a roundabout manner. Third party involvement is likely to be an integral part of the conflict process.

In the family, for example, conflicts between authoritarian fathers and their children are managed through mothers' mediation. Representatives of the parties in conflict play a crucial peacemaker role in disputes in villages (Kozan and Ergen, 1999).

Organizational-conflict practices are to some degree reflections of the larger culture. A survey of conflict-handling styles of managers in traditional companies showed the prevalence of either avoidance or an authoritarian response, depending on the power relationship between the parties. Managers were more dominating of subordinates and more accommodating toward superiors. However, conflicts with peers were mostly avoided. Managers in the innovative companies, who are also accommodative toward their superiors, have been found to use more problem solving with subordinates and to be more compromising with peers. In comparison, traditional managers seemed to rely more on their authority in resolving their conflicts with subordinates. When no clear-cut authority relation existed, no effective conflict resolution method seemed to emerge (Kozan and Ergen, 1999).

The relative absence of problem solving in superior-subordinate conflict and of compromise in conflict among peers suggests a useful role for third parties. Intermediaries may help employees deal with differences that otherwise would be avoided and driven underground, causing continual problems. Third parties may also provide an avenue for timid subordinates to express their opinions and objections concerning a superior's actions. In a culture where direct confrontation is shunned, more third party capacity in organizations may be needed for a healthy conflict resolution process (Kozan and Ergen, 1999).

On the other hand, power in innovative companies combines a clear and respected hierarchy with shared decision making and consensus. Senior people continue to avoid overt assertiveness and are discreet in the exercise of power.

Conflict avoidance is as much part of business as social and political culture. Strategies for arriving at a shared decision without confrontation include private briefing and lobbying. Before a decision-making meeting, for example, those concerned with a particular outcome will talk to each of the others individually before a meeting. They avoid open discussion if they have not prepared for an issue that might lead to disagreement (Mole, 2003). On the other hand, multicultural companies harbor a lot of different cultures that may somewhere trigger conflicts. Conflict that occurs across cultural boundaries thus is also occurring across cognitive and perceptual boundaries, and is especially susceptible to problems of intercultural miscommunication and misunderstanding (Avruch, 1998). These problems flames the conflict, no matter what the root causes are. That shows culture is an important factor in many sorts of conflicts which at first may appear to be exclusively about material resources or negotiable interests.

Defining the impact of cultural difference is especially important for analysts or practitioners of conflict resolution who work in intercultural contexts, while culture affects many of the communicational or interlocutory processes that lie at the heart of most conflict resolution techniques. It must be understood that, the parties in the conflict are not always unbridled, and have a only winning mentality. Many conflicts, involve mixed motives such as competition and cooperation. Another important point is that most conflicts are the combination of competition over goals or resources and the perceptions, beliefs, or values that the parties bring to the competition. For any given conflict, what matters is that parties believe or perceive themselves to be divided over goals, or believe or perceive the resources to be scarce, since parties will in the event act on the basis of their beliefs and perceptions (Avruch, 1998).

Cross-cultural conflict is the conflict occurring between individuals or social groups that are separated by cultural boundaries. The individuals can also be in the same society, but belong to many different groups, organized in different ways by different criteria. They may be from different families or clans. They may have different language, religion, ethnicity, or nationality. They may have different socioeconomic characteristics or from different social classes. They may be from different geographical region or they may be into different political interest groups. They may be from different education system, occupation, or they may have different institutional memberships, trade unions, organizations, industries, bureaucracies, political parties, or militaries. As more complex is the society, the more numerous are potential groupings is to occur. Each of these groups is a potential "container" for culture, and thus any complex society is likely to be made up various "subcultures," that is of individuals who, by virtue of overlapping and multiple group memberships, are themselves “multicultural” which means that conflict across cultural boundaries may occur simultaneously at many different levels, not just at the higher levels of social grouping (Avruch, 1998).

As culture plays an important role in the conflicts, some points must be take into account to respond in right way while solving the conflicts. Cultures can be complicated, elusive and difficult to predict. If we don’t develop comfort with culture as an integral part of conflict, we may find ourselves tangled in its net of complexity, limited by our own cultural lenses. Cultural fluency is a key tool for disentangling and managing multilayered, cultural conflicts. Cultural fluency means familiarity with cultures: their natures, how they work, and ways they intertwine with our relationships in times of conflict and harmony (LeBaron, 2003). The key points to solve the cultural conflicts can be summarized under the following points:

Communication refers how to relate to and with others.

In high context communication, most of a message is transferred by the context surrounding it, rather than words. The physical background, the way things are said, and shared understandings give communication a meaning. Nonverbal cues and signals are essential to comprehension of the message but it may increase the possibilities of miscommunication because much of the intended message is unspoken.

On the other hand, low context communication emphasizes directness rather than using context to communicate. From this point of view, low context communication may help prevent misunderstandings, but it can also grow conflict because it is more confrontational than high context communication.

As people communicate, they move along a continuum between high and low context. Depending on the kind of relationship, the context, and the purpose of communication varies.

Low and high context communication can be not only used to understand the individual communication strategies, but also used to understand cultural groups. Generally, Western cultures tend to use low context starting points, while Eastern and Southern cultures use high context communication.

Where high context communication tends to be featured, it is useful to pay specific attention to nonverbal cues and the behavior of others who may know more of the unstated rules governing the communication and where low context communication is the norm, directness is likely to be expected in return (LeBaron, 2003).

Ways of naming, framing, and taming conflict, vary across cultural barriers.

As an example, traditional elders are referred for their local knowledge and relationships, and they give direction and advice and use their skills in helping parties communicate with each other. The insiders who know the parties and familiar with the history of the situation are preferred in tradition with their high context settings to help to solve the conflicts where the outsiders who are unknown to the parties are more common in low context settings and stay neutral.

In multicultural contexts third parties may use different strategies with very different goals, depending on their cultural sense of what is needed for taming conflicts and approaches also vary across cultures.

Approaches to meaning making also vary across cultures.

People have a range of starting points depending on their favoring rules, laws, and generalizations and people also have favoring exceptions, relations, and contextual evaluation. They also specify their starting points like breaking down wholes into component parts, and measurable results and they focus on patterns, the big picture, and process over outcome. They use inner direction (sometimes for conscious purpose) and outer direction (like natural rhythms, nature, beauty, and relationships).

When we don't understand that others may have quite different starting points, conflict is more likely to occur and to grow. Even though the starting points themselves are neutral, negative motives can easily come to the surface.

Some people also use metaphors for meaning making. Metaphors are compact, tightly packaged word pictures that convey a great deal of information in shorthand form (LeBaron, 2003). The only way to solve the conflict is to talk further. As the two parties talk, they deepen their understanding of each other in context, and learn more about their respective roles and identities.

Identities and roles refer to interpretations of the self.

Whether I am an individual unit, autonomous, fully responsible for myself or am I at first a member of a group and my decisions are affected by them, or not? is the key question to understand our identity and role.

Those who see themselves as separate individuals likely come from societies anthropologists call individualist. Those for whom group allegiance is primary usually come from settings anthropologists call collectivist, or communitarian (LeBaron, 2003).

When individualist and communitarian starting points influence the conflict, it may result to an escalation. But it should be remembered that, most people are not purely individualist or communitarian. Instead, people tend to have individualist or communitarian starting points, depending on one's upbringing, experience, and the context of the situation.

There is no only one-way approach for conflict resolution, as culture is always a factor. Cultural fluency is therefore a core competency for those who want to function more effectively in the situations. Cultural fluency involves recognizing and acting respectfully from the knowledge that communication, ways of naming, framing, and taming conflict, approaches to meaning making, and identities and roles vary across cultures (LeBaron, 2003).

5 Conclusion

Understanding the cultural aspects helps to ensure quality in the companies. The quality can be observed in the working/producing harmony of the employees, managers, in the quality of the products and in the positive feedbacks of customers. The starting point to ensure the quality shall be watching and interviewing employees. The input from the employees shall be used to define communication ways between workers, to define the hierarchy within the company and to resolve corporation-inside conflicts. After creating an own company culture depending on cultural diversity, the new business processes shall be defined to let the employees work in unity. These processes shall be dynamic and applicable to each and every cultural backgrounds so that the working conditions will be better in every implementation steps and the reformed processes will also help to produce quality products at the end. As the desire of the companies is to be trendy and to raise productivity, the main point they have to focus on is to solve the equation of cultural aspects in their business environment.

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ARTS AND CRAFTS MAKERS AND INTERNATIONALIZATION: LESSONS FROM OER-CRAFT PROJECT

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Abstract

In this paper, we aim to introduce the results of the needs for business education analysis undertaken as a part of the OER-CRAFT project. Within the context of these results we discuss the needs of arts & crafts makers as micro-entrepreneurs for acting on newly opening possibilities of this emerging sector. These opportunities are offered by the current information and communication technologies and EU single market. The needs analysis study comprised of both questionnaire survey and qualitative inquiry among arts & crafts micro-entrepreneurs in Slovakia. We have found that these entrepreneurs often lack business thinking and sense of a wider international context. However, to sustain with their activities, they need demand and good awareness of their brand and products. In response to their requests, the OER-CRAFT project offers trainings and on-line tutorials for internationalization, particularly in the framework of the EU single market. This project, however, covers only a certain area of their training needs, and there is space also for other activities for improving their business skills.

Keywords: arts & crafts makers, internationalization, micro-entrepreneurship, OER-CRAFT project, EU single market, online marketplace.

Introduction

Arts & crafts makers have a good precondition to use their talent, hobby and passion to establish self-employment and become economically self-sufficient. Thus, helping to turn arts & crafts production into vital business activities can contribute to solving employment and low household income challenges, especially in rural areas where such activities traditionally flourish. While being equipped with craft skills and artistic talent, these potential micro-entrepreneurs frequently lack business skills and knowledge required to establish, manage and expand their business activities. Also, as they frequently come from rural areas, they often lack good approach to support services and expert advice in this field. Besides being active on local or regional market, the next level is to focus beyond the regional or national borders. However, selling abroad is perceived as something not attainable, and this option is frequently not even considered. Nevertheless, with nowadays free movement of

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Suggested citation: GAL, P., GRAUSOVA, K. and HOLIENKA, M. (2017) Arts and crafts makers and internationalization: lessons from OER-CRAFT project. *Comenius Management Review*, 11(1), p. 31-43

goods within the EU single market and easy access to technologies connecting the entire world in real time, there is an unprecedented opportunity to approach potential buyers irrespective their physical location. There exist several initiatives to help arts & crafts makers acting on this opportunity. One of such is the EU's Erasmus+ program funded OER-CRAFT project, aimed at addressing the capacity and training needs of the arts & crafts (would be) micro-enterprises across EU to sustain their competitiveness for enhanced growth and employment. In this paper, we aim to introduce results of the needs analysis undertaken as a part of the project and, within the context of these results, to discuss the needs of arts & crafts makers and (would be) micro-entrepreneurs for acting on opportunities for internationalization offered in current socio-economic context.

1 Arts & crafts sector in the current economic and market context

In the past, many of the classic crafts have been replaced by the industrial large-scale production, which could produce consumer items in large quantities and at much lower costs than the classical craft producers could do (Kalavsky, 1979). That is why today many traditional crafts have become something of a rarity. The crafts are traditionally defined as "a specialized small-scale non-agricultural manufacture, based on the manufacturer's own handiwork that requires adequate institutionally obtained qualification and professional organization" (Kalavsky, 2007). In this article, we see the crafts broader as a part of the arts & crafts sector, since many craftsmen switched from traditional production of consumer items to the production of art-craft goods, in which an important role plays the originality of the product as well as its artistic value. In this sector one can find a wide range of protagonists – from the famous artists through the skilled craftsmen to budding amateurs. Luckman (2015, p. 55) classifies them into the following categories:

- Hobbyists,
- Part-time Makers (top-up/incidental income, not primary paid work activity),
- Part-time Small Business Makers (perhaps building towards business as primary income),
- Full-time Small Business Makers,
- Part-time Design/Studio/Arts & Craft Makers,
- Professional Full-time Design/Studio/Arts & Craft Makers,
- Named Artist (senior and established enough to now potentially be the design director of a studio production model of making).

Arts & crafts are a part of the cultural and creative industries (hereafter, "CCIs"). According to the European Commission (2010), cultural industries are those industries producing and distributing goods or services which at the time they are developed are considered to have a specific attribute, use or purpose which embodies or conveys cultural expressions, irrespective of the commercial value they may have. Besides the traditional arts sectors (performing arts, visual arts, cultural heritage – including the public sector), they include film, DVD and video, television and radio, video games, new media, music, books and press. Creative industries are those industries which use culture as an input and have a cultural dimension, although their outputs are mainly functional. They include architecture and design, which integrate creative elements into wider processes, as well as subsectors such as graphic design, fashion design or advertising.

Another aspect associated with the artistic handicrafts, is the preservation of folk traditions. Each country or region has its characteristic, historically given activities, products, or something in what it stands out. In our country (Slovakia) it is particularly the lace craft, the tinker craft, pottery, wood carving, and some others.

In our perspective, arts & crafts industry means the manual production of a variety of products such as decoration, furniture or jewelry using both the old as well as new techniques. Manufacturers of these items – craftsmen use their talent, potential, skills and competencies. These products are exceptional, as they provide customers in addition to the material (utility) also with a non-material value (i.e. aesthetic and emotional). An important aspect of the art & craft practice is the presentation of the craftsmen. Watching the craftsmen in action poses an experience for the audience that also translates into the value of his/her product. Buying unique handmade items means buying "something created by a person and not just by a machine" (Anderson, 2012, p. 182). This increased value is reflected by the higher price compared to the mass manufactured products. Arts & crafts makers don't serve the mass market, but rather a specific segment of customers, who favor this type of products, and they know and can appreciate also financially its value. It is rather a niche market. As the market for the arts & crafts goods might be relatively small in the context of the individual regions or even countries (particularly small ones), it could limit the demand for the arts & crafts products. This can endanger some producers to survive economically. Previous incarnations of handmade popularity have been bound by local relationships and limits on the potential market for bespoke items (as was the case for example, for the arts & crafts movement; see Luckman 2012).

At present, we are witnessing a growing interest in products of the arts & crafts industry. The modern ICT technologies allowed to extend the served area and have brought new opportunities for the sale of the arts & crafts goods and at the same time significantly reduced the costs of distribution and overall transaction costs. The internet allows to find small-scale arts & crafts makers easily (even across ocean) and has driven the demand for their products. Thus, the remote and foreign markets became available also for the micro-entrepreneurs. The international marketing and distribution networks became accessible to sole traders. They allowed artistic craftsmen to present themselves, associate and create communities for which the geographical distance is no longer a serious obstacle. The internet allows for the networking of "excited enthusiasts in one corner of the world to inspire and encourage similarly energized individuals elsewhere, with a depth and speed not previously possible" (Gauntlett, 2011, p. 62). Sites like Etsy and knitting social network Ravelry act as key players in the international web of crafters (Gauntlett, 2011, p. 68). These two sites exemplify the community-building capacities of the internet. "The contemporary handmade economy is enabled by a very different intersection of the local with the global in the form of the international marketing and distribution pathways enabled by the "long tail" of internet distribution" (Luckman, 2015, p. 1).

Many recent studies have shown that the cultural and creative industries represent highly innovative companies with a great economic potential and are one of Europe's most dynamic sectors, contributing around 2.6% to the EU GDP, with a high growth potential, and providing quality jobs to around 5 million people across the EU-28. What is much less known is that the most of SMEs in fact are micro enterprises with less than ten employees. These enterprises, often run by the owner and operating in craft and artisan sectors, employ around one third of the total European workforce (Future Skills Needs in Micro and Craft(-type) Enterprises up to 2020, p. 12). In 2016 more than US$ 2.84 billion of merchandise was sold through the Etsy.com website, which is the top online global marketplace specialized in handmade and vintage items, and handmade supplies. The sales of Etsy.com have grown approximately by about 20% in recent three years. Although Etsy.com is the main player in this area, there are numerous other online retail sites specializing in selling handmade small-scale creative production. While inclusivity of women in business sector is generally rather low, their involvement in arts & crafts activities is traditionally high. "Women make up the majority of online designer-maker micro-entrepreneurs, often establishing a small business as a way to balance caring responsibilities with paid employment and/or being in top-up family income" (Luckman, 2015, p. 1).

2 Introducing the OER-CRAFT project

The OER-CRAFT project aims at addressing the capacity and training needs of the micro-enterprises across EU to sustain their competitiveness for enhanced growth and employment. In particular, it focuses on micro-enterprise arts & crafts makers and attempts to equip them with knowledge and skills required to expand their activities beyond the traditional regional markets to address international audience. The main objective of the project is the creation of an online OER ("Open Educational Resources") platform including a collection of good practices, procedures and advice aimed at promoting the creation of micro-enterprises (including those of only one person) in the fields of hand-made arts & crafts (e.g. textiles, ceramics, jewelry, etc.), focused on current and future entrepreneurs from rural areas of any region at any of the participating EU countries, who often lack the tools and advice necessary to start their own business and fully develop their untapped potential, and thereby to promote and market their own products and/or services not only at regional and/or local level, but also at national/EU levels and even internationally. The OER-CRAFT project was implemented from September 2015 to August 2017, and it was funded from European Union's Erasmus+ program under its "Key Action – 2" (KA2), sub-action "Strategic Partnerships".

Figure 1. OER-CRAFT logo (Source: www.craftstraining.eu)

To accomplish the goals of the OER-CRAFT project, a consortium comprising eight experienced partners (from academia, support providers, private and NGO sector) from six EU countries focused on the following main activities:

- Development of OER platform and project website available in 7 languages,
- Needs analysis to identify key elements of training needed by arts & crafts micro-enterprises,
- Development of OER and face-to-face training materials in the following fields: Basic legal and regulatory issues, ICT and use of ICT tools for internationalization, Basics of market analysis for internationalization, and Branding and communication for internationalization,
- Testing and validation of the training materials, development of guidelines for future training.

With respect to the abovementioned activities, the OER-CRAFT reported to the end of the implementation period creation of 70 training courses and 140 training fiches in 7 languages (10 resp. 20 in each language), together with other support materials, and provided them for open access through the newly created OER platform. During the project period the platform reached more than 72,500 visits. As for face-to-face interaction, altogether 371 stakeholders and target group members were reached through multiplier events, and 544 potential and actual micro-entrepreneurs were reached through trainings in the testing and validation phase.

3 Materials and methods

The analysis presented in our paper is based on OER-CRAFT project's need analysis aimed at identifying the key elements of training needed by arts & crafts micro-enterprises to be prepared to pursue internationalization opportunities. The needs analysis comprised of two main parts: a) Questionnaire survey among arts & crafts micro-entrepreneurs in Slovakia, and b) Qualitative inquiry among female arts & crafts micro-entrepreneurs in Slovakia.

As for the questionnaire survey, in order to better understand perceptions of arts & crafts makers on level of their competences, required support and perceived barriers related to their micro-business and internationalization, we have executed a questionnaire survey among eight active arts & crafts producers from small towns and villages close to Bratislava. The results of survey were analyzed using the methods of descriptive statistics, with special focus on identification of factors that were indicated as most important or relevant by our respondents.

As for the qualitative inquiry, a series of qualitative semi-structured interviews with five arts & crafts producers from small towns and villages close to Bratislava was executed to better understand the attitudes and experiences of female arts & crafts micro-entrepreneurs, and to analyze their perceptions of barriers related to internationalization. All interviewed producers were female, and all of them had at least two or three years' experience in arts &

crafts micro-entrepreneurship. All of them sell their products on the home market, but some of them also managed to penetrate on the foreign markets. The interviews were analyzed using the methods of narrative and content analysis. The semi-structured interview comprised of four main parts:

- Foundations of the business – focused on the business itself and on the entrepreneur. The aim was to get information on how the business was founded, how the entrepreneur started with it and if she is able to earn enough money for living.
- Customers – core of this part is to define customer group. We also wanted to know how an entrepreneur got her current customers and how she gets new ones. In this part, we also asked about the sales channels.
- Foreign sales – we wanted to know if the business had a foreign purchase orders, how many and from which countries.
- How to act on the market – we wanted to know some tips and tricks of the interviewed micro-entrepreneurs, based on their experience. We were also interested in perceived barriers to doing business in home or foreign country.

4 Results

4.1 The main findings from the questionnaire survey

The survey participants answered about the competencies they consider most important in the arts & crafts initiatives.

Question 1. Which competencies do you consider important for the people involved in the development of micro and craft-type entrepreneurship initiatives? (1 = very important, 4 = not important).

Table 1. Competencies considered most important in the arts & crafts initiatives

Competence	Average
Calculating costs	1.00
Acquisition of new orders and customer groups	1.13
Entrepreneurial thinking and acting	1.25
Customer service communication	1.38
Developing creative ideas	1.50
Managing quality in business processes and services	1.63
Networking skills of the micro and craft type entrepreneur	1.88
Developing new services, broaden range of offered products	2.00
Implementing new technology in the business	2.13
Communicating with other companies and institutions	2.25
Developing knowledge about foreign markets	2.50
Communicating with customers and employees in foreign language	2.50
Securing own innovations and patents	2.63

Source: authors

The respondents prioritized <1;2) basic business functions like cost calculation, customer acquisition, idea and product development and managing quality of processes. As less important <2;3) they perceived implementation of new technologies, developing knowledge about foreign markets and communicating in foreign language. This could be mainly due to the fact that we interviewed quite young initiatives still focused on the domestic market and having little or no experience with foreign markets.

Based on the thematic areas that were defined in the OER-CRAFT, we investigated for respondents' prioritization of perceived needs for support.

Question 2. In which of the following thematic areas do micro and craft-type entrepreneurs need support for the effective operation of an arts & crafts / micro company? (1 = High priority, 4 = None).

Table 2. Thematic areas micro and craft-type entrepreneurs might need support with

Thematic area	**Average**
Basic legal and regulatory implications to tap into the EU Single Market	1.50
Branding and communication for competitiveness / internationalization	1.75
Building customer trust and earning references on foreign markets	1.75
Basics of market analysis for competitiveness / internationalization	1.88
Demand and supply analysis, testing and validation on foreign markets	1.88
Networking for micro and craft-type enterprises	2.13
ICT and use of ICT tools for competitiveness / internationalization	2.13
Business planning for micro and craft-type enterprises	2.25
Analysis of the external environment: SWOT, Customers, International markets	2.25
EU Projects Management for micro and craft-type enterprises	2.75

Source: authors

It can be noted that highest priority <1;2) is given to issues connected with internationalization and operations on foreign markets, like legal and regulatory requirements, marketing communication and market analysis. As other relevant <2;3), but less important areas were identified networking, the use of information and communication technologies to boost competitiveness and internationalization, and the business planning area.

The next question related to the training undertook by the participants, asked them whether they had received any business training recently.

Question 3. Are you currently attending or have you attended during the last three years any training related to micro and craft-type entrepreneurship development?

Table 3. Attendance of entrepreneurial trainings

Entrepreneurship training	
Attending / have attended	0%
No experience	100%

Source: authors

None of the participants received any training about their business development in the last three years.

The next question addressed the capacities or skills of this type of enterprises needed to set up or manage their business and if they have been adequately covered by the existing education in their home country.

Question 4. To which extent does the existing education and training system in your country covers adequately the knowledge and competence areas that may be required for setting up and operating a micro or craft-type enterprise? (1 = To a great extent, 4 = Not at all).

Table 4. Coverage of the needed knowledge and competences by the current education system

Competence	**Average**
Basics of market analysis for competitiveness / internationalization	2.13
Business planning for micro and craft-type enterprises	2.38
Analysis of the external environment: SWOT, Customers, International markets	2.38
Branding and communication for competitiveness / internationalization	2.50
EU Projects Management for micro and craft-type enterprises	2.50
Demand and supply analysis, testing and validation on foreign markets	2.63
Networking for micro and craft-type enterprises	2.63
ICT and use of ICT tools for competitiveness / internationalization	2.63
Basic legal and regulatory implications to tap into the EU Single Market	2.88
Building customer trust and earning references on foreign markets	3.13

Source: authors

The results show that the current education and training system in our country doesn't fully match the participants' needs to set up and develop a company in the arts & craft sector. It corresponds with the answers to the second question. The widest gaps were identified in areas: demand and supply analysis, networking, the use of information and communication technologies to boost internationalization, legal and regulatory requirements, and building customer trust and earning references.

The next question lists the topics the arts & craft entrepreneurs are interested when asked about specialized training to increase their capacity.

Question 5: If you were given the possibility to attend specialized training to increase your capacity, which topics or themes would you be interested in? (1 = Most likely, 4 = Extremely unlikely).

Table 5. Training topics the arts & craft entrepreneurs are interested in

Topic	Average
Project management / Strategic planning	1.38
Basic legal and regulatory implications to tap into the EU Single Market	1.50
Branding and communication for competitiveness / internationalization	1.63
EU projects management for micro and craft-type enterprises	1.88
Basics of market analysis for competitiveness / internationalization	2.00
Financial management and planning	2.00
Business planning for micro and craft-type enterprises	2.25
Networking for micro and craft-type enterprises	2.38
ICT and use of ICT tools for competitiveness / internationalization	2.63
Analysis of the external environment: SWOT, Customers, International markets	2.88

Source: authors

In first place the arts & craft entrepreneurs are interested in project management and strategic planning, followed by the legal and regulatory requirements, branding and communication for competitiveness / internationalization and EU projects management for this type of enterprises. We see the lower interest into the basics of market analysis for competitiveness / internationalization, financial management and planning, business planning for micro and craft-type enterprises, and networking for micro and craft-type enterprises. Surprisingly, lowest interest was expressed to the use of ICT tools for competitiveness / internationalization and analysis of the external environment.

Question 6: In case you will be considering to enter a foreign market, which issues / questions would you find the most important? (1 = Most important, 4 = Least important).

Table 6. The most important issues associated with entering a foreign market

List of most important / important questions	Average
A. Competitive analysis and finding a place on the market	
Difference from competitors? Advantages/disadvantages/uniqueness.	1.25
Anyone selling the same / similar product? Who is that?	1.38
Can I compete with the existing competitors?	1.38
What means are available for me to penetrate the market?	1.50
Prices of similar product on target market.	1.57
What are the costs of market analysis / survey?	1.75
Who exactly my customers are?	1.88
Is the market for my products in the target country big enough?	1.88
What are the risks of entering a foreign market?	1.88
Is there any trade representation available on the foreign market?	1.88
Which is the best "first foreign market" for me to enter?	2.00
How to do promotion and advertising on the foreign market?	2.00
Size of the target market. How big is the potential customer segment?	2.00
B. Using online tools for foreign market analysis	
Difference from competitors? Advantages/disadvantages/uniqueness.	1.13
Anyone selling the same / similar product? Who is that?	1.25

List of most important / important questions	Average
Prices of similar product on target market.	1.25
Size of the target market. How big is the potential customer segment?	1.50
How do I recognize whether and who is interested in my products?	1.50
Is the market for my products in the target country big enough?	1.63
Which foreign market is suitable for testing?	2.00
Thinking locally on foreign markets	
How shall I adapt my product to the foreign market?	2.00
Building customer trust on foreign markets	
How will I earn first references to my products?	1.25
What is the relevant and available platform for references on the foreign market?	1.25
Looking for partners on foreign markets	
What sales channel is most efficient?	1.38
Who can I partner with on the foreign market?	1.50

Source: authors

The last table shows the significance participants attach to the issues about internationalization and options of being able to uncap the potential of the Single European Market. As it can be noted, the participants underlined the importance of knowledge on topics such as competitive analysis and finding a place on the market, using online tools for foreign market analysis, including the need to think locally, build customer trust and look for partners on foreign markets.

4.2 The main findings from the qualitative inquiry

At first, we wanted to know how the arts & crafts producers started their businesses. In all cases, it was a hobby at the beginning. Arts & crafts production is not only a sales-based business. Arts & crafts producers are artists who put feelings and emotions into their products. If the producer doesn't enjoy her work, her products would only be serial products that could be bought anywhere. Interviewed producers do their work on 100 %. It is their hobby and a full-time job at the same time. They love their work a want to continue in it.

Second part of questions was focused on the customers. Customers are very important for every business. If the business hasn't enough customers, it will soon or later stop working. This is true also for the creative industries. As we focused on the very specific sector of this industry, customer portfolio is very similar for every interviewed producer. Their process of customer acquisition and retention is quite common and could be applied in every other business.

Currently selling through the internet is the most popular way of product distribution. This way provides a number of advantages, e. g. simple communication with customers or the possibility to present the whole product portfolio. However, it is not enough to post a photo on the internet and wait for the customers' response. Most of the producers share the same opinion, that if you want to promote the products properly, you should invest quite a lot of effort, time and money into this activity. If the product photos don't look good, they could even discourage customers from the purchase. The second important issue is personal contact and personal experience. It is important to maintain contacts with current customers and to gain new contacts. Contacts are also the way how to approach the new customers. Personal contact with customer gives seller many opportunities. She can talk with customer and inform him/her about the details he/she can’t find anywhere else. Sellers could gain customers also by the way they act towards them. They can give advice how to care about the product or where – on which other places – they can buy them. If the customer is satisfied with the producer, the purchasing process and the product itself, he/she could share this personal experience and attract new customers. People believe more the seller and the product if they could see a real customer’s review or know about a personal experience of someone else.

In the third part of questions we were interested in the foreign sales. Most of the interviewed producers sell their products abroad only to individual customers. There are some reasons why it is like that. The first are the existing barriers we have focused on in the previous part of questions. These barriers comprise mainly of different laws that producers have to adapt to. It is about a strong competition. Every day a new competition arises, not only in the home market, but also abroad. For the producer, it is more difficult to fight with competitors abroad, because it costs her a lot of time and money. Fear of unknown is another major barrier. It is about insufficient courage and about the fear of new things. The second reason why producers don’t go abroad is the sufficient number of customers on the home market. Some of interviewed producers declared that the number of customers they have is sufficient, as they even don’t have enough capacity to satisfy the current demand. Although this is positive information, the situation of sufficient number of orders may not last forever. Moreover, it thus seems that they are not using the entire market potential to develop and scale their activities.

The last part of questions was intended to provide some tips and tricks for arts & crafts micro-entrepreneurs. It is essential for them to have courage and not to be afraid to enter the market. They can’t ignore the appropriate training or preparation and be engaged in various kinds of events. For the producers are the fairs and markets, which promote and advance arts & crafts very important. There are some barriers like laws and legislation, they should be aware of them. The competition shouldn’t be underestimated, because it can be uncompromising. Finally, there is an internal barrier which is made by the producer himself/herself. It is about his/her courage and the attitude to the entire process.

Conclusion

Creative industries including art & crafts are experiencing a renaissance in recent years and thus offer the opportunity for creative individuals to develop micro businesses in this sector. This business may no longer be bound and limited locally, as it was once with the operation of brick and mortar stores that have been serving close area with high operating costs. Thanks to new information and communication technologies the primary method of presentation and distribution for arts & crafts makers becomes the internet.

The same sales channel as on the home market could be used also in the case of fledged sales to the foreign markets. The possibilities of internet are almost unlimited and it provides a wide frame of opportunities that could be exploited. In addition to local websites like SAShE.sk, there are many portals, through which producers can sell their products worldwide, for example: Etsy.com, Dawanda.com, etc.

Our survey has shown that our micro-entrepreneurs from the arts & crafts industry have not developed sales abroad yet. As the main barriers to the penetration of foreign markets they state the fear of unknown and low levels of knowledge. There might be also a psychological barrier to present themselves in a foreign country. Some entrepreneurs are not interested to venture into the rest of the world, since they have enough customers in the domestic market.

The OER-CRAFT project focuses just on training of arts & craft makers for internationalization and the penetration of foreign markets using the modern internet technologies. The OER-CRAFT project provides means to meet the detected necessary training needs for internationalization. The survey, however, showed significant gaps these people have in overall entrepreneurial thinking and know-how. It seems that some would need help with basic issues such as pricing and cost calculation, customer acquisition or quality management. Taking this into account, it seems that the OER-CRAFT project is slightly ahead of the Slovak arts & craft industry. However, it is clear, that over time arts & craft makers would run out of the domestic market and would have to look for business opportunities abroad. The tutorials and training materials created within the OER-CRAFT project would significantly help them with this.

It is obvious that the needs of the art & crafts producer's community in the field of entrepreneurship education are wider and quite specifically targeted OER-CRAFT project can't fill up all of them. Therefore, it is necessary that other programs aimed at helping entrepreneurs to develop their entrepreneurial skills in this sector would be initiated by their associations, regional authorities, as well as central government. Entrepreneurs themselves could share their experience and knowledge for example in the form of best practices. This space could also provide the internet platform created within the OER-CRAFT project in the future.

Finally, we are aware of several limitations of our findings. First, the samples in both quantitative as well as qualitative surveys were rather small. Even though they provide certain initial picture, robustness of findings would benefit from expanding the sample. Similarly, additional information value could be added by expanding the sample to other countries (however, here the country specifics might get lost) or by covering other regions, especially rural regions of Slovakia. Moreover, qualitative inquiry would benefit from inclusion of male respondents, to find out if there are any gender-specific patterns, or whether the findings are gender-indifferent. As our study describes the partial needs analysis, its result shall rather serve as inspiration and guidance for further inquiry. Besides, we recommend for further research related to the OER-CRAFT project to deal also with the usage of educational resources and their effect on internationalization or usage of ICT among arts & crafts micro-businesses.

Acknowledgements

This article was developed within the project OER-CRAFT, which was implemented by consortium of eight partners from six EU countries, and supported by Erasmus+ program under its "Key Action – 2" (KA2), sub-action "Strategic Partnerships". Authors of the article were involved in implementation of the project activities.

This project has been funded with support from the European Commission. This article and its content reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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